Rasamsonia species isolated from cystis fibrosis patients: MALDI-TOF/MS identification and antifungal susceptibility by EUCAST method

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Résumé en anglais	A wide variety of filamentous fungi are able to colonize respiratory tract of patients with cystic fibrosis (CF). Recently, fungi of the genus *Rasamsonia* (formely *Geosmithia*) have been described as a new emergent group of fungi pathogen in CF patients. The genus *Rasamsonia* comprises nine species including *Rasamsonia argillacea* (*sensu lato*) which is a complex of species (*R. argillacea sensu stricto*, *R. piperina* , *R. eburnea*, and *R. aegroticola*). Only species belonging to species complex R. argillacea have been yet isolated from patients with chronic granulomatous disease and CF. Accurate identification at the species level of the members of the *Rasamsonia* complex on the basis of morphology criteria is challenging, and frequent misidentification with a *Penicillium emersonii* have been reported. Matrix-assisted laser desorption ionization (MALDI)-time of flight (TOF)/mass spectrometry (MS) is a powerful tool to rapidly identify moulds at the species level. We investigated the potential of this technology to discriminate Rasamsonia species. Nine reference strains were used to build a reference database library. Profiles from 3-, 5- and 7-day-old cultures of each reference strain were analysed to identify species-specific discriminating profiles. The database was tested for accuracy using a set of 74 clinical isolates collected from 29 CF-patients in 4 French hospitals (Rouen, Giens, Angers and Paris). For each isolate, the species identification obtained using MALDI-TOF/MS was compared to this obtained by Diversilab method. Our results showed a high reliability of the MALDI-TOF analysis. Antifungal susceptibility testing was also performed for 20 isolates (identified as *R. argillacea*, *R. aegroticola* or *R. piperina*) from 13 patients using the microdilution broth reference method of the Antifungal Susceptibility Testing Subcommittee of EUCAST. All isolates tested showed a high MIC of > 8 mg/L to voriconazole, and the majority also showed high MICs to itraconazole (MIC > 8 mg/L), except for *R. piperina* strains (MIC 0.5 - 1 mg/L). The susceptibility to amphotericin B was variable (MIC: 0.5 - > 8 mg/L), with no specific distinction according to *Rasamsonia* species. Finally, all isolates exhibited low MICs to micafungin (0.0312 - 0.125 mg/L). Altogether, our results show that MALDI-TOF/MS is a powerful tool for rapid identification of *Rasamsonia* species that cannot be currently identified by morphological examination in the clinical setting, and confirm that the members of *R. argillacea* complex, colonizing respiratory tract in CF patients, have a very low susceptibility to available antifungal agents.
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